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SYSTEMATIC REVIEW

Impact of Chronic Nodular Prurigo on Quality of Life: A Systematic Review of the Literature

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ABSTRACT

Introduction: Chronic nodular prurigo (CNPG), also known as prurigo nodularis, is an inflammatory neuroimmune skin disorder characterized by intense pruritus and nodular lesions resulting from scratching. CNPG affects patients' health-related quality of life (HRQoL); however, the magnitude of burden and clinical implications remain underrecognized in dermatologic practice.

Methods: This systematic review was conducted in accordance with PRISMA 2020 guidelines. Searches of PubMed and the Cochrane Library (April 2025) identified observational studies reporting HRQoL, symptom burden, or unmet needs in adults with CNPG. Two reviewers independently screened studies, extracted data, and assessed methodological quality using the STROBE checklist.

Results: Of 464 records identified, 23 studies met the inclusion criteria. CNPG was consistently associated with substantial impairment in HRQoL, primarily driven by uncontrolled pruritus. Mean Dermatology Life Quality Index scores ranged from 7 to 22, EQ-5D scores from 57.4 to 65.3, and Health Utilities Index Mark III scores were approximately 0.52, significantly lower than in control population ($p<0.001$). Pruritus emerged as the dominant symptom and central determinant of HRQoL impairment, reflected by elevated Itchy Quality of Life, 5-D Itch, and 5-D Pruritus Life Quality scores. Sleep disturbances were reported by up to 100% of patients, while anxiety and depressive symptoms affected 26–46% and 16–57% of patients, respectively. CNPG was associated with impairment in daily activities (up to 100%), occupational functioning (up to 83%), and social or sexual relationships (27–95%). Treatment satisfaction was low (mean 57.4%), and higher pruritus intensity was

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associated with worse HRQoL and lower satisfaction. However, no mediation analyses were performed, and causal relationships between pruritus severity and HRQoL impairment cannot be established.
Conclusions: CNPG is associated with a substantial and multidimensional disease burden extending beyond cutaneous manifestations. Pruritus may emerge as the central driver of this burden, underscoring the importance of systematic assessment of HRQoL and itch severity.

PLAIN LANGUAGE SUMMARY

Chronic nodular prurigo, also known as prurigo nodularis, is a long-lasting skin condition that causes severe and persistent itching and the development of hard, itchy skin nodules due to repeated scratching. This condition can strongly affect daily life, but its full impact on patients' quality of life is often underestimated in routine clinical care. In this study, the authors reviewed published observational research to better understand how chronic nodular prurigo affects patients' physical, emotional, and social well-being. The review showed that people living with this condition experience a marked reduction in quality of life, mainly driven by the intensity of itching. Many patients reported sleep problems, emotional distress such as anxiety or depression, and difficulties carrying out everyday activities, working, and maintaining social or intimate relationships. Overall satisfaction with available treatments was low, particularly among patients with more severe itching. These findings suggest that managing chronic nodular prurigo requires more than treating skin symptoms alone. Better patient-centered care approaches are needed, with a strong focus on effective itch control and attention to the emotional and social challenges faced by patients, in order to meaningfully improve their quality of life.

Keywords: Chronic nodular prurigo; Disease burden; Health-related quality of life; Patient-reported outcomes; Pruritus; Treatment satisfaction; Unmet medical needs

Key Summary Points
Chronic nodular prurigo is associated with a substantial deterioration in health-related quality of life, largely driven by the intensity of pruritus.
Evidence from observational studies shows that CNPG imposes a multidimensional burden, including sleep disturbance, emotional distress, and limitations in daily, social, and occupational functioning.
Pruritus emerges as the central determinant of patient-reported outcomes, with greater itch severity consistently associated with worse quality of life and lower treatment satisfaction.
Current treatment approaches often fail to fully address patients' expectations and unmet needs, highlighting a gap between clinical management and patient experience.
These findings underscore the need for multidisciplinary, patient-centered care strategies targeting both pruritus control and broader psychosocial impacts of CNPG.

INTRODUCTION

Chronic nodular prurigo (CNPG), also referred to as prurigo nodularis, represents a distinct and burdensome form of chronic prurigo (CPG). It is a neuroimmune skin disorder characterized by intense, chronic pruritus and predominantly nodules resulting from repeated scratching [1, 2]. CNPG prevalence is heterogeneous and estimated globally at 0.083% in the general population [3–5]. Incidence is also variable, ranging from 0.3 to 3 per 10,000 person-years [3, 5, 6]. The term was formally defined in 2018 by the European Prurigo Project as persistent pruritus lasting over 6 weeks and nodular lesions that may be localized or widespread [7]. These

nodules are firm, clearly circumscribed, and often show excoriations or crusting due to chronic scratching and impaired skin healing [8, 9].

Pruritus is the most frequent and severe symptom of CNPG and is known to profoundly impair patients' health-related quality of life (HRQoL) [8–10]. Beyond this hallmark symptom, CNPG notably affects various physical, emotional, and psychosocial domains, with patients commonly reporting sleep disturbances, pain, emotional distress, and considerable limitations in daily activities [8, 10]. However, available evidence on the overall impact of CNPG on HRQoL remains fragmented, and studies vary considerably in the domains assessed, the instruments used, and the outcomes reported. As a result, the relative contribution of pruritus, disease severity, and other symptoms to the overall patient burden is not consistently defined across the literature.

Despite its clinical relevance, CNPG remains poorly recognized in clinical practice and underrepresented in the research literature. In particular, there is limited synthesis of evidence addressing which aspects of HRQoL are most affected, how symptom severity relates to patient-reported outcomes, and to what extent current treatment approaches meet patients' expectations and needs. Therefore, this systematic review was undertaken to synthesize the available observational evidence on the impact of CNPG on patients' HRQoL, aiming to identify the most affected domains and to explore the relationship between pruritus intensity, disease severity and patient reported outcomes, including treatment satisfaction and unmet medical needs.

METHODS

Study Design

This systematic review was conducted in accordance with the PRISMA 2020 (Preferred Reporting Items for Systematic reviews and Meta-Analyses) statement (Table S1) [11] and the Cochrane Handbook for Systematic Reviews of Interventions [12].

Information Sources and Search Strategy

A comprehensive literature search was performed in the PubMed and Cochrane Library databases, covering studies published between April 2015 and April 2025. The search strategy combined MeSH terms and free-text keywords related to CNPG, its impact on HRQoL, and unmet medical needs from the patients' perspective (Tables S2 and S3). Boolean operators were used to combine search terms, and filters were applied for language (English or Spanish).

Eligibility Criteria

Inclusion criteria comprised observational studies conducted in adult populations diagnosed with CNPG and reporting data on symptom burden, HRQoL outcomes, assessment tools used, and/or patient-reported unmet needs. Studies were excluded if they evaluated pharmacological interventions exclusively, as the focus of this review was on the patient-reported burden of disease rather than treatment efficacy.

Study Selection

Study selection was carried out independently by two reviewers using the Rayyan platform (https://www.rayyan.ai). Disagreements were resolved through consensus. Screening was conducted in two stages: an initial review of titles and abstracts, followed by full-text assessment. All stages of the selection process were documented using a PRISMA-compliant flow diagram.

Data Extraction

Data extraction was performed independently by two reviewers using pre-designed, standardized data extraction forms. Extracted data included study characteristics, patient demographics, outcome assessed and tools used. Any discrepancies were resolved through discussion.

Quality Assessment

The methodological quality of the selected studies was assessed using the STROBE checklist, as all studies included had an observational design.

Data Synthesis

Given the heterogeneity of study designs, outcome measures, and assessment tools, a quantitative meta-analysis was not performed. Findings were synthesized descriptively and narratively.

Ethical Approval

This article is based exclusively on previously published studies and does not contain any new studies with human participants or animals performed by the authors.

RESULTS

A total of 464 records were identified (336 from PubMed and 128 from the Cochrane Library). After removal of duplicates, the remaining records were screened by title and abstract, resulting in the exclusion of 294 and 83 records, respectively, for failing to meet eligibility criteria. Fifty-four full-text articles were assessed for eligibility, of which 23 met the inclusion criteria and were included in the final synthesis. The full selection process is presented in the PRISMA flow diagram (Fig. 1).

Study Characteristics

A total of 23 publications were included in this review. Of these, 10 (43.5%) were cross-sectional, 7 (30.4%) were retrospective, 5 (21.7%) were prospective, and 1 (4.3%) employed a mixed observational design combining prospective and retrospective data collection (Table S4).

Population Characteristics

The studies showed substantial heterogeneity in terms of sample size, geographical setting, and sociodemographic characteristics. The mean number of participants per study was 868.8 (range 21–4484) and the mean age of patients with CNPG was 55.5 years, ranging from 36.4 to 66.0 years. Male patients constituted an average of 61.6% of study populations; geographically, the studies covered a wide range of regions (Table S4).

Seven studies reported disease severity [13–19], using different scales, such as Global Questionnaire (GQ) [15], Investigator Global Assessment (IGA) [17–19], and Prurigo Activity Score (PAS) [17]. Three studies did not report their method for assessing disease severity [13, 14, 16]. Most patients had moderate disease, ranging from 33% to 55% of the sample. A smaller proportion had severe disease (14–48%), and a minority were reported as having mild prurigo (10–35%).

Half of the studies (47.8%) described the dermatological signs and/or symptoms in patients with CNPG. Pruritus was the most frequently reported symptom ($N=10$), with stated rates ranging from 77.8% to 100% at the time of patient's examination. Other sensory symptoms reported included burning sensations ($N=6$), stinging ($N=5$), and tingling ($N=3$) (Table 1). Regarding dermatological signs, cutaneous nodules were reported in four studies, with percentages ranging from 28.4% to 95.0% (Table 1). Other reported pruriginous lesions were excoriations, sores, and discoloration (Table 1). Seventeen studies (73.9%) described pruritus characteristics, most frequently reporting its intensity ($N=13$), mean duration ($N=7$), frequency ($N=4$) (Table 2), and location ($N=6$; Fig. 2).

Impact of CNPG on HRQoL

The impact of CNPG on HRQoL was assessed in 20 studies (86.9%), either using patient-reported outcome measures (PROMs) or by reporting the proportion of patients affected across various HRQoL domains (Table S5). On the basis of the Dermatology Life Quality Index (DLQI) [20], we categorized HRQoL into six domains: general, personal relationships, occupational, symptoms or physical, daily activities, and emotional and mental (Table S5). These domains reflect the

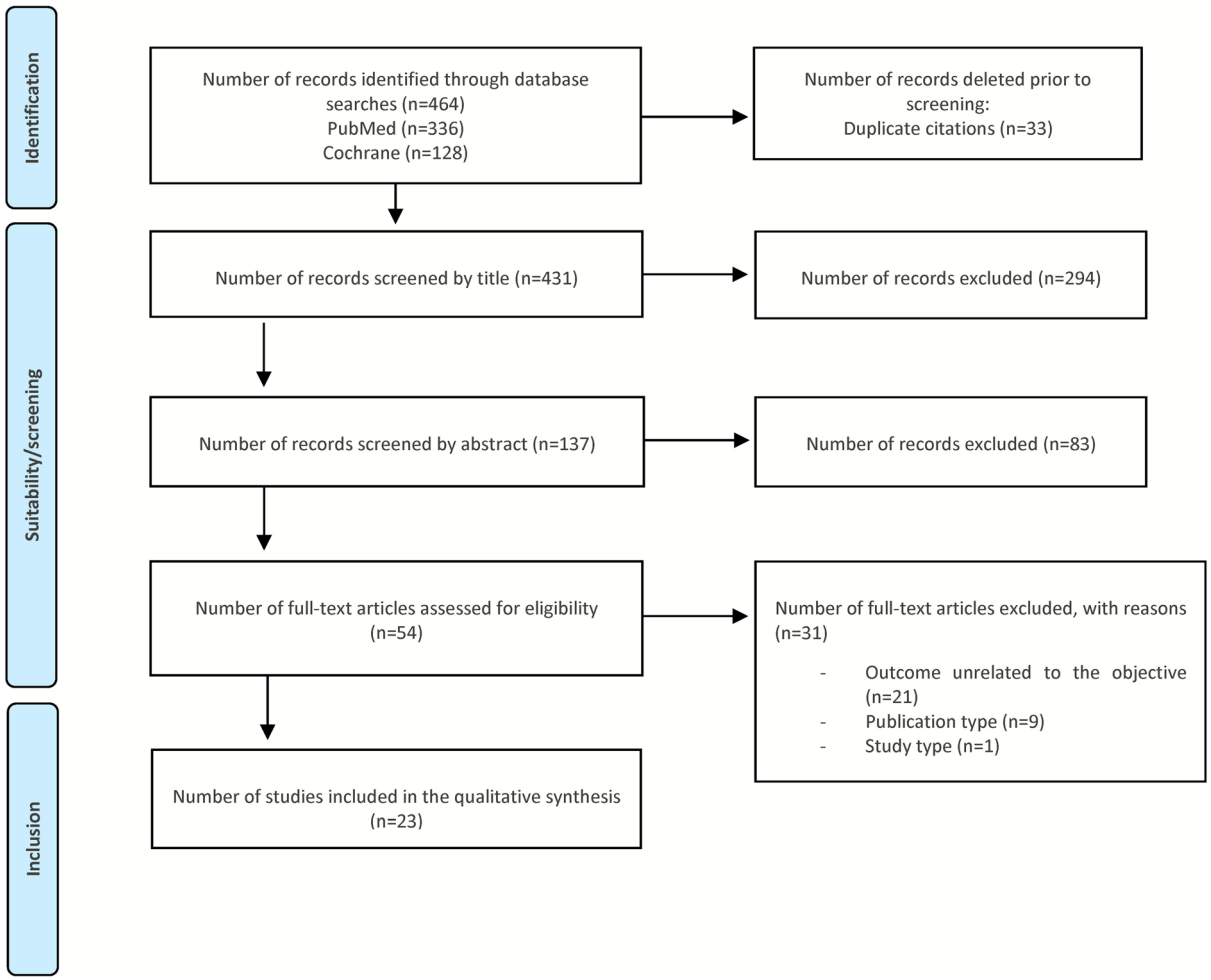

Fig. 1 PRISMA flow diagram. Records were excluded at title/abstract stage because of lack of relevance

multidimensional impact of dermatological conditions as captured by the DLQI.

The most widely applied PROMs were the DLQI ($N=10$), the Hospital Anxiety and Depression Scale (HADS; $N=4$), the Patient Health Questionnaire (PHQ; $N=3$), and the Pittsburgh Sleep Quality Index (PSQI; $N=3$) (Table S5).

The specific impact of pruritus was analyzed in eight studies (34.8%). The PROMs most frequently used were the 5-D Pruritus Life Quality Questionnaire (5-D PLQ; $N=2$) and the Itchy Quality of Life Questionnaire (ItchyQoL; $N=2$).

Impact of CNPG on General HRQoL

Between 75% [17] and 100% [21] of patients reported that CNPG negatively affects their HRQoL. Additionally, 12 studies employed various standardized and validated instruments to quantify its impact on HRQoL (Table 3). Four studies compared data from patients with CNPG to those of healthy control groups [13, 14, 22, 23].

EQ-5D scores ranged from 57.4 to 65.3, showing a statistically significant difference compared to healthy controls (79.9 ± 15.6; $p<0.001$). Regarding the DLQI, mean values ranged between 7 and 22, while the Health Utilities Index Mark III (HUI-3) showed a mean of 0.52 ± 0.06, which was also significantly lower than that of controls (0.86 ± 0.003; $p<0.001$) (Table 3). Murota et al. [15] also identified a significant association between the clinical severity of CNPG and HRQoL impairment, as DLQI

Table 1 Characteristics of the CNPG study population

Author (year)	Pruritus (% patients)[a]	Cutaneous nodules (% patients)	Other cutaneous lesions/alterations (% patients)	Tingling sensation (% patients)	Burning sensation (% patients)	Stinging (% patients)	Bleeding from wounds or scratching (% patients)
Aggarwal et al. (2021) [31]	77.8	28.4	–	62.0	52.6	53.8	–
Brenaut et al. (2018) [13]	88.0	–	–	–	–	–	–
Ficheux et al. (2025) [14]	–	–	–	–	55.7	41.6	–
Gründel et al. (2020) [38]	–	44.3	Excoriations: 44.3 Inflammation: 15.4	–	39.9	–	–
Pereira et al. (2020) [24]	71.1	–	–	17.5	–	35.7	14.1
Pereira et al. (2021) [33]	79.8	–	–	–	90.0	–	–
Rodriguez et al. (2023) [16]	100.0	≥ 20: 90.0	Dry skin: 100.0 Crust: 95.0 Lesions or sores: 86.0 Discoloration: 86.0 Raw skin: 81.0 Rough skin: 76.0 Feeling of heat: 62.0	57.0	–	90.0	100.0
Ständer et al. (2023) [17]	–	–	–	–	–	–	–
Steinke et al. (2018) [39]	–	–	–	–	5.0	–	–
Taghaddos et al. (2024) [40]	100.0	–	Dry skin: 53.0	–	38.0	–	–
Todberg et al. (2020) [21]	–	> 20: 50.0	Feeling of heat: 42.0	–	–	72.0	–

[a]Percentage of population with pruritus symptomatology at the time of examination in each study

Table 2 Studies reporting pruritus characteristics

Author (year)	Duration	Frequency	PROMs		
			VAS (mean ± SD)	Itch-NRS (mean ± SD)	Peak NRS[a] *N* (%)
Aggarwal et al. (2021) [31]	*N* (%) 1–5 years 21 (35.7%) > 10 years 19 (32.2%)	–	–	–	–
Brenaut et al. (2018) [13]	–	–	(Scale 0–10) 6.6 ± 3.1		
Erdem et al. (2021) [22]	–	–	7.88 ± 1.64		
Ficheux et al. (2025) [14]	–	–	–	5.4 ± 2.9 (C 0.5 ± 1.4; $p < 0.0001$)	–
Gründel et al. (2020) [38]	–	–	24 h 6.4 ± 2.7 (CP 5.4 ± 2.7; $p < 0.001$) 4 weeks 7.0 ± 2.2 (CP 6.4 ± 2.2; $p = 0.003$)	–	–
Gwillim et al. (2021) [28]	Mean ± SD, years 8.75 ± 8.9	Episodes/day; *N* (%) > 10: 19 (49.0%)	–	7.7 ± 2.3	–
Murota et al. (2024) [15]	Median (IQR), months 36 (4–420)	–	–	6.2 ± 2.7	–
Steinke et al. (2018) [39]	Mean ± SD, years 3.8 ± 0.9	Mean ± SD 1.1 ± 0.2	6.2 ± 2.2	6.5 ± 2.0	–
Sutaria et al. (2022) [18]	–	–	–	W-Itch NRS/24 h 9.0 ± 1.2 (C 0 ± 0; $p < 0.001$)	–
Taghaddos et al. (2024) [40]	–	–	Scale 0–10: 9		

Table 2 continued

Author (year)	Duration	Frequency	PROMs		
			VAS (mean ± SD)	Itch-NRS (mean ± SD)	Peak NRS[a] *N* (%)
Todberg et al. (2020) [21]	Mean ± SD, years 11.6 ± 8.2	Many times/day; *N* (%) 34 (65.4%)	6.6 ± 2.4	–	–
Yin et al. (2023) [19]	–	–	–	–	> 4 points: 596 (79.8)
Zeidler et al. (2021) [27]	Median (95% CI), years 3.5 (3.03–4.11)	–	–	W-Itch NRS/24 h median (95% CI) 8.5 (8.5–9.0) A-Itch-NRS/24 h median (95% CI) 6.5 (6.0–7.0)	–
Zeidler et al. II (2021) [32]	Median (IQR), years CPG 3.0 (1.0–8.2) CP-NL 2.5 (1.0–7.0) $p = 0.02$	Similar to an attack; *N* (%) CPG 1232 (72.0) CP-NL 2027 (73.1) $p = 0.719$	–	W-Itch NRS/24 h median (95% CI) CPG 6.0 (4.0–8.0) CP-NL 5.0 (3.0–6.5) $p < 0.001$ A-Itch-NRS/24 h median (95% CI) CPG 6.0 (4.0–8.0) CP-NL 5.0 (3.0–7.0) $p < 0.001$	–

A average, *C* control, *CI* confidence interval, *CP* chronic pruritus, *CPG* chronic prurigo, *CP-NL* chronic pruritus on non-lesional skin, *h* hour, *IQR* interquartile range, *Itch-NRS* Itch Numerical Rating Scale (ranging from 0 to 10, 0 = no itch, 10 = worst imaginable itch), *N* number, *Peak NRS* Peak Numerical Rating Scale (ranging from 0 to 10, 0 = no itch, 10 = severe itch), *PROMs* Patient-Reported Outcome Measures, *SD* standard deviation, *VAS* visual analogue scale (ranging from 0 to 10, 0 = no itch, 10 = severe itch), *W* worst

[a]Peak NRS measures pruritus intensity over the last 24 h. In Yin et al., 79.8% of patients had worst-itch NRS ≥ 4, corresponding to at least moderate pruritus (4–6 scale points) or severe/very severe pruritus (7–10 scale points) over the preceding 24 h. Therefore, 79.8% of the patients suffered moderate to very severe pruritus over the last 24 h

scores were significantly higher among patients with severe ($p < 0.01$) and moderate disease ($p < 0.05$) compared to those with mild forms.

The impact of pruritus on general HRQoL was assessed in four articles (Table 3). On the 5-PLQ, patients with CNPG presented significantly higher scores than controls (11.2 vs. 1.4; $p < 0.0001$), while mean scores on the ItchyQoL and 5-D Itch Scale ranged from 72.1 to 74.1, and 16.8 ± 4, respectively. Finally, the impact of pruritus was also evaluated using a Likert-type scale, yielding a mean of 3.6 ± 1, indicating a moderate to high level of agreement with the perception of pruritus as having an adverse effect on HRQoL. Furthermore, in Pereira et al., 49.3% of participants identified pruritus as the

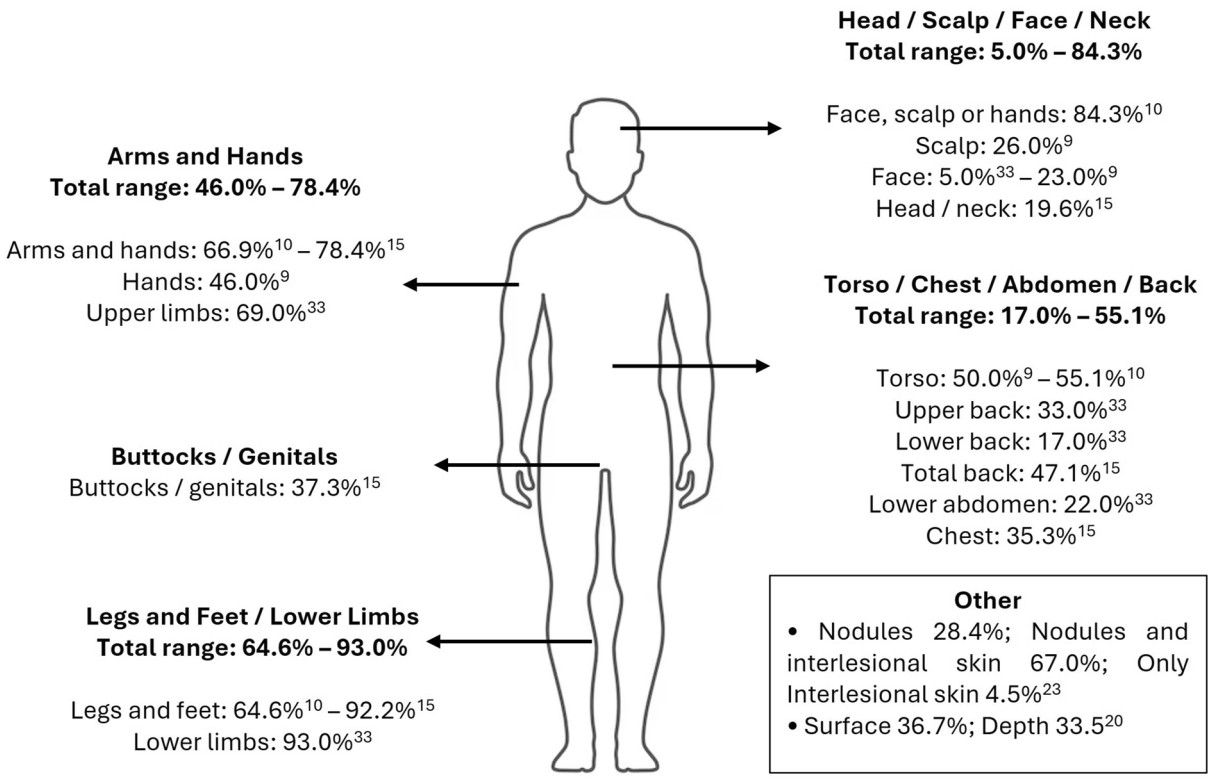

Fig. 2 Location of pruritus

main contributor to HRQoL impairment [24]. Similarly, Todberg et al. reported that 75% of participants experienced negative HRQoL effects attributable to pruritus [21].

Impact on Personal Relationships

The impact of CNPG on personal relationships was assessed in five articles (Table S5).

Between 27% [21] and 81% [16] of patients reported that their social life was negatively affected, while a higher proportion (65–95%) [16, 25] indicated that CNPG also interfered with their social relationships. The impact of pruritus on the social domain was assessed in only one study [16], which reported that 12% of patients experienced impaired personal relationships due to pruritus.

Regarding sexual function, 41.7% of patients with CNPG reported impaired sexual life based on DLQI item 9 [26], while 7% experienced partner rejection [16]. No studies specifically evaluated the impact of pruritus on sexual health.

Occupational Impact

Three studies evaluated the impact of CNPG on work and educational activities (Table S5). Two used ad hoc questions, while one applied the Work Productivity and Activity Impairment (WPAI; expressed as percentages ranging from 0 to 100%, where higher values indicate greater impairment) questionnaire, revealing negative repercussions in 71% [16] and 83% [25] of patients. Presenteeism and work productivity loss were significantly higher in patients with severe disease compared to those with mild disease (presenteeism: 40.0% vs. 10.0%; $p=0.0205$; work productivity loss: 40.0% vs. 10.0%; $p=0.0176$) [15].

Finally, only one study assessed the specific impact of pruritus on occupational and educational functioning, reporting that 29% of patients experienced a reduction in work or academic performance as a direct consequence of pruritus [16].

Table 3 Impact on general HRQoL

Author (year)	Impact on general HRQoL			Impact of pruritus on general HRQoL		
	EQ-5D (mean ± SD)	DLQI	HUI-3 (mean ± SD)	5-PLQ	Itchy-QoL	5D Itch (mean ± SD)
Aggarwal et al. (2021) [31]	–	Mean ± SD 16.4 ± 7.6	–	–	–	16.8 ± 4.1
Brenaut et al. (2018) [13]	57.4	Mean 12.4	–	–	–	–
Dhawan et al. (2018) [30]	–	Mean ± SD 17.3 ± 10.3	–	–	–	–
Ficheux et al. (2025) [14]	65.3 ± 20.9 (C 79.9 ± 15.6; $p < 0.001$)	–	–	Mean ± SD 11.2 ± 5.1 (C 1.4 ± 2.4; $p < 0.001$)	–	–
Gründel et al. (2020) [38]	–	Mean ± SD 12.1 ± 6.7 (C 9.2 ± 2.6; $p < 0.001$)	–	–	–	–
Murota et al. (2024) [15]	–	Mean ± SD 7.1 ± 3.6 (mild: 4.1; moderate: 6.1; severe: 11.1)	–	–	–	–
Pereira et al. (2020) [24]	–	–	–	Median (IQR) 2.4 (1.6–3.0)	–	–
Steinke et al. (2018) [39]	–	Mean ± SD 11.6 ± 6.1	–	–	Mean ± SD 74.1 ± 15.4	–
Sutaria et al. (2022) [18]	–	Mean ± SD CNPG (NI) 13.0 ± 4.1 CNPG (I) 21.9 ± 6.4 $p = 0.0152$	–	–	–	–
Todberg et al. (2020) [21]	–	Mean ± SD 7.0 ± 5.6	–	–	–	–
Whang et al. (2022) [23]	–	–	0.52 ± 0.06 (C: 0.86 ± 0.003; $p < 0.001$)	–	–	–

Table 3 continued

Author (year)	Impact on general HRQoL			Impact of pruritus on general HRQoL		
	EQ-5D (mean ± SD)	DLQI	HUI-3 (mean ± SD)	5-PLQ	Itchy-QoL	5D Itch (mean ± SD)
Yin et al. (2023) [19]	–	*N* (%) > 6 points: 372 (51.3)	–	–	–	–
Zeidler et al. (2021) [27]	–	Median (95% CI) 13.0 (11.0–15.5)	–	–	Median (IQR) CPG 72.6 (61.6–83.6) CP-NL 59.4 (48.4–70.4) $p = 0.001$	–

5D Itch 5-Dimensional Itch Scale (ranging from 5 (no pruritus) to 25 (most severe)), *5-PLQ* 5-Item Pruritus Life Quality (ranging from 0 (no impact of pruritus in HRQoL) to 20 (highest impact of pruritus in HRQoL)), *C* control, *CI* confidence interval, *CPG* chronic prurigo, *CP-NL* chronic pruritus on non-lesional skin, *CNPG (I)* chronic prurigo nodularis inflammatory, *CNPG (NI)* chronic prurigo nodularis non-inflammatory, *DLQI* Dermatology Life Quality Index (0–1 = no effect at all, 2–5 = small effect, 6–10 = moderate effect, 11–20 = very large effect, 21–30 = extremely large effect on patient's life), *EQ-5D* EuroQol 5-Dimension (ranging from 0 (worst state of health) to 100 (best imaginable state of health)), *HRQoL* health-related quality of life, *HUI-3* Health Utilities Index Mark 3 (ranging from − 0.36 (health states worse than death) to 1.00 (perfect health)), *I* inflammatory, *IQR* interquartile range, *Itchy-QoL* Itchy Quality of Life (ranging from 22 to 110, where higher scores indicate worse HRQoL), *N* number, *NI* non-inflammatory, *SD* standard deviation

Symptoms and Physical Impact

Ten studies assessed the impact of CNPG on the physical and functional domain, evaluating aspects such as sleep quality (*N* = 10), activities of daily living (*N* = 2), overall physical functioning (*N* = 1), pain (*N* = 1), and fatigue (*N* = 1) (Table S5).

The proportion of patients reporting sleep disturbances attributable to CNPG was examined in four studies, with rates ranging from 84% to 100% [16, 17, 25, 27]. Additionally, five studies evaluated sleep quality using three validated PROMs: the Pittsburgh Sleep Quality Index (PSQI; *N* = 3), the Sleep Numerical Rating Scale (Sleep-NRS; *N* = 1), and the Sleep Disturbance Numerical Rating Scale (SD-NRS; *N* = 1) (Table 4). A further four studies specifically investigated the impact of pruritus on sleep, reporting that

Table 4 Sleep quality and sleep disturbance measurements in CNPG

Author (year)	PSQI (mean ± SD)	Sleep-NRS (mean ± SD)	SD-NRS (mean ± SD)
Aggarwal et al. (2021) [31]	11.6 ± 4.6	–	–
Erdem et al. (2021) [22]	8.6 ± 6.1	–	–
Murota et al. (2024) [15]	–	4.0 ± 2.9	–
Ständer et al. (2023) [17]	–	–	5.1 ± 2.7
Todberg et al. (2020) [21]	6.2 ± 2.0	–	–

PSQI Pittsburgh Sleep Quality Index (ranging from 0 (better sleep quality) to 21 (the worst sleep quality imaginable), *SD* standard deviation, *Sleep-NRS* Sleep Numerical Rating Scale (ranging from 0 (no sleep loss) to 10 (the worst possible sleep), *SD-NRS* Sleep Disturbance Numerical Rating Scale (ranging from 0 (no sleep loss) to 10 (the worst possible sleep)

42.5–71.0% of patients experienced pruritus-related sleep impairment [16, 17, 24, 28].

One study investigated the overall physical impact of CNPG, employing the Short Form-8 Health Survey (SF-8), standardized to a mean of 50 and a standard deviation of 10 in the general population, with higher scores indicating better health status. This reported a mean physical functioning score of 48.3. Patients with mild disease had significantly better outcomes than those with severe disease (50.5 vs. 45.4; $p<0.05$) [15].

Finally, pain was evaluated in a single study using the EQ-5D instrument, where 80% of participants reported experiencing moderate to severe pain or discomfort [29].

Impact on Daily Activities

Two studies reported the proportion of patients whose activities of daily living were affected by CNPG (Table S5), yielding highly variable results, ranging from 4.9% to 100% [16, 24]. One of these studies provided a detailed breakdown, revealing that CNPG had a considerable impact on general daily activities (71%), dressing (81%), personal hygiene and self-care (71%), and planning of daily tasks (57%) [16]. Moreover, 47% of patients reported that pruritus directly affected their daily functioning [16].

Impact on Emotional and Mental Health

Fifteen studies assessed the emotional and mental health impact of CNPG (Table S5). The most frequently explored were mental health disorders such as depression ($N=14$) and anxiety ($N=8$). These were followed by embarrassment and self-consciousness ($N=3$), and stress ($N=3$), suicidal ideation ($N=2$), then general emotional impact ($N=1$), mood disturbance ($N=1$), and perceived stigmatization ($N=1$) (Table S5).

The overall impact of CNPG on the emotional aspect was assessed using the SF-8. This revealed a mean score of 47.9 for the mental health dimension [15].

Regarding embarrassment and self-consciousness, over half of the patients expressed concern about their appearance and reported feeling self-conscious when being observed by others, with rates of 57% [25] and 52% [16], respectively. Consistent with these findings, data from the Dysmorphic Concern Questionnaire (DCQ), scores ranging from 0 to 21, where 0–5 is satisfied with appearance, 6–8 at risk of body dissatisfaction, and >9 moderate to severe dissatisfaction, showed that patients with CNPG had significantly higher scores than healthy controls (mean ± SD 5.7 ± 4.9 vs. 3.8 ± 3.5; $p<0.0001$), indicating increased sensitivity to perceived alterations in physical appearance [14].

The proportion of patients with CNPG who reported stress showed also significant variability, ranging from 8.7% [25] to 54% [28]. In the study by Ficheux et al. [14], stress levels were assessed using the Perceived Stress Scale (PSS-10), which yields total scores ranging from 0 to 40, with higher scores indicating greater perceived stress. It showed that patients with CNPG had significantly higher scores (ranging from 11 to 20) than the healthy control group (mean ± SD 16.9 ± 6.8 vs. 14.2 ± 6.3; $p<0.001$). In another study, 95% of patients reported experiencing mood disturbances associated with the condition [16]. Fifty-two percent of participants expressed feelings of sadness linked to specific factors, including scarring, pruritus, sleep disturbances, and disease flare-ups [16].

Perceived stigmatization was assessed using the Perceived Stigmatization Questionnaire (PSQ), scoring each item on a 5-point Likert Scale (scores between 1–5), where higher scores mean greater perceived stigmatization. The mean ± SD scores for the healthy control group and the CNPG patient group were 1.7 ± 0.4 and 1.8 ± 0.6, respectively ($p=0.003$) [14].

Only two studies assessed the emotional impact of pruritus. In one study, 53% of patients reported that pruritus negatively affected their emotional state [16]. In the other, Pereira et al. [24] explored the emotional experience associated with pruritus in greater depth, with patients describing it using terms such as "bothersome" (55.2%), "burdensome" (50.7%), and "agonizing" (46.6%).

A total of 15 publications evaluated the impact of CNPG on mental health. Of these, seven studies reported the percentage of affected patients, while nine used one or more standardized tools to assess the mental health impact,

with one study reporting both the percentage and the use of a standardized assessment tool (Table S5). The overall impact of CNPG on mental health was assessed using the Mini-International Neuropsychiatric Interview (MINI), a validated clinician-rated instrument to determine psychiatric comorbidities. This score indicated that 62.9% of male patients and 24.1% of female patients met diagnostic criteria for at least one psychiatric disorder [30].

Anxiety was evaluated in eight studies (Table S5). Four reported the prevalence of anxiety symptoms, while five used validated PROMs to quantify its severity, including the HADS ($N=4$) and the Generalized Anxiety Disorder Scale-2 (GAD-2; $N=1$) (Table 5). The proportion of patients with anxiety ranged from 26% to 45.6% [13, 19, 25, 31]. Two studies also reported significantly higher scores on the HADS-A and GAD-2 scales among patients with CNPG compared to healthy controls (Table 5). The effect of the pruritus on anxiety was not evaluated in any of the articles.

Depression was assessed in 14 publications (Table S5). Of these, five studies reported the prevalence of depression, while the remaining nine used one or more validated PROMs, including the HADS-D ($N=4$), the Patient Health Questionnaire (PHQ; $N=3$), and the Beck Depression Inventory (BDI; $N=2$) to quantify the impact

Table 5 Assessment of mental health impact

Author (years)	Anxiety		Depression		
	HADS-A	GAD-2 (mean ± SD)	HADS-D	PHQ (mean ± SD)	BDI (mean ± SD)
Brenaut et al. (2018) [13]	Mean ± SD 8.3 ± 4.8 (C 4.7 ± 3.5; $p < 0.001$)	–	Mean ± SD 7.6 ± 4.1 (C 4.3 ± 3.2; $p < 0.001$)	–	–
Dhawan et al. (2018) [30]	–	–	–	PHQ-9 12.20 ± 5.9	–
Erdem et al. (2021) [22]	–	–	–	–	15.0 ± 9.5
Ficheux et al. (2025) [14]	–	2.2 ± 1.8 (C: 1.2 ± 1.4; $p < 0.01$)	–	PHQ-4 4.4 ± 3.4 (C 2.2 ± 2.4; $p < 0.001$) PHQ-2 CNPG 2.3 ± 1.9 (C 1.0 ± 1.3; $p < 0.001$)	–
Gründel et al. (2020) [38]	Mean ± SD 7.7 ± 4.4 (CP 7.9 ± 4.2; $p = 0.546$)	–	Mean ± SD 6.9 ± 4.3 (CP 6.1 ± 4.2; $p = 0.020$)	–	–
Murota et al. (2024) [15]	–	–	–	PHQ-9 4.33 ± 2.07	–
Sutaria et al. (2022) [18]	–	–	–	–	CNPG (NI): 8.0 ± 7.8 CNPG (I): 19.5 ± 12.8
Zeidler et al. (2021) [27]	Median (IQR) 7.0 (6.4–9.3)	–	Median (IQR) 7.0 (7.0–9.2)	–	–
Zeidler et al. (2021) [32]	Median (IQR) CPG 7.0 (4.0–10.0) CP-NL 7.0 (4.0–10.0) $p = 0.168$	–	Median (IQR) CPG 6.0 (3.0–10.0) CP-NL 5.0 (2.0–8.0) $p < 0.001$	–	–

BDI Beck Depression Inventory (ranging from 0 to 63, 0–13 = non/minimal depression, 14–19 = mild depression, 20–28 = moderate depression, 29–63 = severe depression), *C* control, *CNPG* chronic nodular prurigo, *CP* chronic pruritus, *CPG* chronic prurigo, *GAD-2* Generalized Anxiety Disorder Scale-2 (ranging from 0 to 6, scores > 3 = potential clinical anxiety), *HADS* Hospital Anxiety and Depression Scale (ranging from 0 to 21, 0–7 = normal, 8–10 = mild anxiety, 11–14 = moderate anxiety, 15–21 severe anxiety), *I* inflammatory, *IQR* interquartile range, *NI* non-inflammatory, *PHQ* Patient Health Questionnaire (ranging from 0 to 27, 0–4 = none/minimal depression, 5–9 = mild depression, 10–14 = moderate depression, 15–29 = moderately severe depression, 20–27 = severe depression), *SD* standard deviation

(Tables 5, S5). The prevalence of depression ranged from 16.4% to 57% [13, 16, 19, 25, 31]. Across most of the studies employing PROMs, statistically significant differences were observed between patients with CNPG and healthy control groups (Table 5). Finally, only one study specifically quantified depression attributed to pruritus, estimating its prevalence at 44.4%.

Suicidal ideation was assessed in two publications (Tables 5, S5). In D'Amiano et al., prevalence was minimal, with a single case (4.3%) [25], whereas Brenaut et al. reported 13 cases (48.1%) [13].

Patient Satisfaction and Unmet Medical Needs

Three studies assessed patients' perceptions of treatment. Murota et al. [15] employed the 9-item Treatment Satisfaction Questionnaire for Medication (TSQM-9), which generates scores ranging from 0 to 100%, with higher scores indicating greater satisfaction. The mean overall satisfaction score was 57.4%, which decreased with disease severity (65.1% in mild cases vs. 45.4% in severe cases) and showed a negative correlation with prurigo severity, pruritus intensity, and quality of life. Zeidler et al. [32] applied the Patient Needs Questionnaire (PNQ), which measures, in a five-point scale from no important to very important, the significance of treatment goals terms. The study showed that patients with CNPG placed greater importance on therapeutic goals related to psychosocial well-being, compared to those with chronic pruritus on non-lesional skin (CP-NL). Finally, Pereira et al. [33] reported that 56.8% of patients were dissatisfied with recent treatment. The most valued goals were relieving pruritus, improving skin lesions, enhancing sleep quality, and understanding the disease origin. Pruritus intensity was significantly lower in treated patients (2.5 vs. 9.5), indicating therapeutic efficacy.

Methodological Quality of the Studies

Based on the STROBE checklist, study quality ranged from 16.5 to 22 points: 13% were high quality, 52.2% moderate–high, 26.1% moderate–low, and 8.7% low (Table S6).

DISCUSSION

The most important finding of this systematic review is that CNPG is associated with a substantial and clinically meaningful impairment in HRQoL, primarily driven by pruritus. CNPG is a chronic inflammatory skin disease that significantly impairs various aspects of HRQoL, including physical, emotional, social, and occupational domains. This analysis seeks to contextualize the global impact of the condition to better understand the magnitude of its burden on patients.

The overall impact of CNPG on HRQoL, assessed using validated instruments such as the DLQI, EQ-5D, and HUI-3, consistently indicates clinically meaningful impairment. Higher DLQI scores were observed among patients with more severe disease, while EQ-5D and HUI-3 values were significantly lower than in controls, reflecting substantial limitations in both dermatology-specific and generic health domains. Taken together, these findings indicate a level of HRQoL impairment comparable to that reported in other chronic dermatologic conditions associated with a high disease burden [34, 35].

Pruritus represents a major contributor to HRQoL impairment in CNPG. Findings from the 5-PLQ, ItchyQoL, and 5D-Itch questionnaires consistently showed significantly higher scores in patients compared to controls. This may indicate a substantial symptom burden, although no statistical analyses support these impressions. Therefore, this statement should be taken carefully. Consistent with other chronic dermatological diseases [36], pruritus emerges as a key determinant of HRQoL impairment and a major component of the overall disease burden, highlighting the importance of therapeutic strategies

that effectively address itch alongside cutaneous manifestations.

The impact of CNPG on patients' social relationships and work ability is also considerable. Many patients reported that visible signs of the disease, such as skin lesions and associated pruritus, may lead to significant social isolation. This is supported by the findings of the studies that evaluated emotional impact.

In the occupational setting, many patients reported reduced productivity and presenteeism at levels comparable to or exceeding those observed in other chronic dermatological diseases [34]. This decline in work or academic performance highlights the broader economic and social burden associated with CNPG.

Furthermore, CNPG is also associated with a substantial burden of emotional and mental health impairment that is often underrecognized in routine dermatologic care. A high prevalence of psychiatric manifestations, particularly anxiety, depressive disorders, and suicidal ideation, was observed, consistent with prior evidence linking chronic dermatological diseases to significant psychiatric comorbidity [37].

Notably, one study reported higher levels of anxiety among patients with CNPG compared with those with other dermatological conditions [13], suggesting a distinctive psychological burden. Reported rates of depression varied widely, but were consistently higher than in control populations, especially in studies using scales such as the HADS-D, PHQ, and BDI. Importantly, nearly half of the patients directly attribute depressive symptoms to pruritus, emphasizing the need for a comprehensive approach to this condition. These findings support previous evidence highlighting anxiety and depression as relevant comorbidities in chronic dermatological diseases [37]. Suicidal ideation is also represented as a psychiatric comorbidity in patients with CNPG. Nevertheless, the available evidence does not allow for a robust estimate of suicidal ideation in patients with CNPG, given the heterogeneous results of the included studies [13, 25]. This highlights the significant psychological burden experienced by patients with CNPG, where the chronic and often debilitating nature of pruritus not only exacerbates anxiety and depression but also contributes to more severe mental health issues, such as suicidal thoughts.

Finally, patient satisfaction data reveal a gap between current treatments and patient expectations, particularly in severe cases. Low satisfaction scores and strong correlations with pruritus intensity and HRQoL suggest that inadequate control of itch remains a key unmet need in CNPG.

Taken together, this review advances current knowledge by demonstrating that pruritus functions as a central mechanism linking physical impairment, sleep disturbance, emotional distress, and limitations in social and occupational functioning in CNPG. This multidimensional burden extends beyond cutaneous manifestations and is often underrecognized in routine clinical assessment. The heterogeneity of patient-reported outcome measures across studies further underscores the lack of standardized approaches to evaluating HRQoL, with commonly used instruments such as the DLQI potentially failing to capture pruritus-related sleep disturbance and psychological impact.

This review has several limitations that should be considered when interpreting the findings. The available evidence is derived exclusively from observational studies, most of which were cross-sectional, limiting the ability to infer temporal or causal relationships between pruritus, disease severity, and HRQoL outcomes. Substantial heterogeneity across study designs, populations, and outcome measures limited comparability and precluded quantitative synthesis, with variability in patient-reported outcome measures likely contributing to differences in the magnitude of reported impact. In addition, attribution of specific outcomes to pruritus was assessed in only a subset of studies, which may underestimate its contribution to broader functional and psychological impairment.

CONCLUSION

Although CNPG primarily affects the skin, its impact extends far beyond cutaneous symptoms, being associated with a substantial deterioration in patients' quality of life. These findings

suggest the need for comprehensive, multidisciplinary management addressing the physical, psychological, and emotional dimensions of the disease, with particular attention to pruritus as a key determinant of patient burden, as well as for further research to better understand its drivers and optimize patient care.

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Data Availability. The data underlying this article are available in the article and in its online supplementary material. The protocol of the study is available from the corresponding author upon reasonable request.

Declarations

Conflict of Interest. Pedro Herranz Pinto served as consultant, received honoraria for research and received speaker fees from Abbvie, Almirall, Amgen, Boehringer, Bristol Myers Squibb, Celgene, Galderma, Leopharma, Pfizer, Roche, Sanofi, Takeda, UCB pharma. Bibiana Pérez García received honoraria for research from Galderma, Sanofi, Almirall, Amgen and Incyte; served as a consultant and received speaker fees from Galderma, Sanofi, Leo, Almirall and Abbvie, and received other financial benefits from Sanofi, Abbvie and Almirall. Victoria Bonne Moreno and Beky Norela Ortiz are employees of Galderma. Héctor David De Paz Fernández, and Luis Lizán declared no conflict of interest.

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